



Range-wide Monitoring of the Desert Tortoise: 2001-05 Summary

Desert Tortoise Monitoring Committee

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Review Draft Report



- Available on DTRO web page:
http://www.fws.gov/nevada/desert_tortoise/dt_reports.html
- Comments due April 29

Kilometers Sampled



Year	Kilometers
2001	3,410
2002	4,178
2003	4,200
2004	7,434
2005	~ 9,462



Data Collection

- Composed of a large number of records

Characteristic	Yearly variation
Total records	12,000 - 24,000
Observers	50 – 100
Transects	700 - 2,200
Total km walked	3,000 - 9,500
Waypoints	9,000 - 22,000
Observations	1,500 - 2,100



QA/QC

- General QA/QC process
 - Establish a set of rules to flag potential errors
 - Identify violations (records that broke the rules)
 - Review and resolve violations (1000's per year)

- Three levels of QA/QC

Contractor QA/QC

Identify and correct common, easily corrected errors

2nd Level QA/QC

Combine contractor databases
Verify contractor QA/QC
Identify/correct complex errors

Final QA/QC

Verify other levels of QA/QC
Identify/correct complex errors
Ensure final consistency throughout entire database
Create final usable products

QA/QC Products



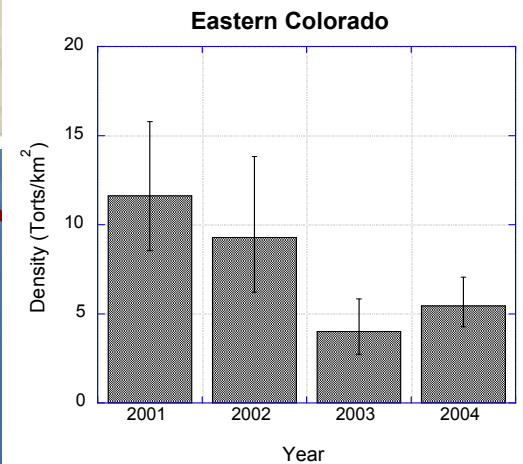
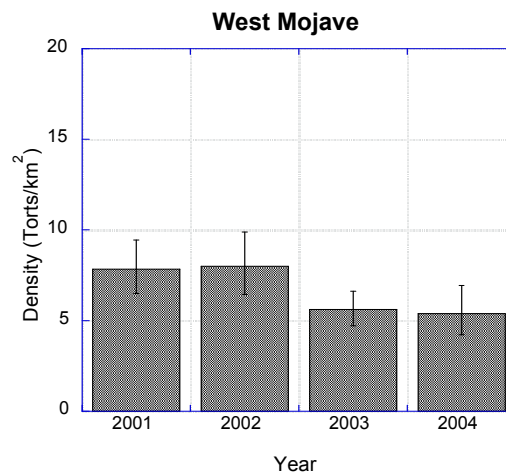
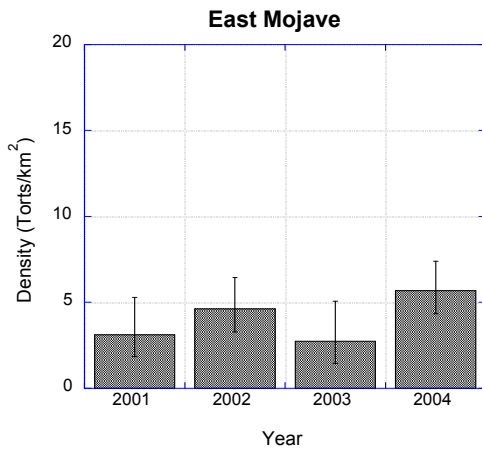
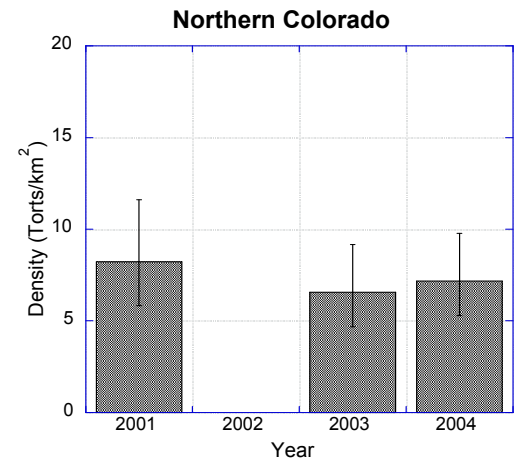
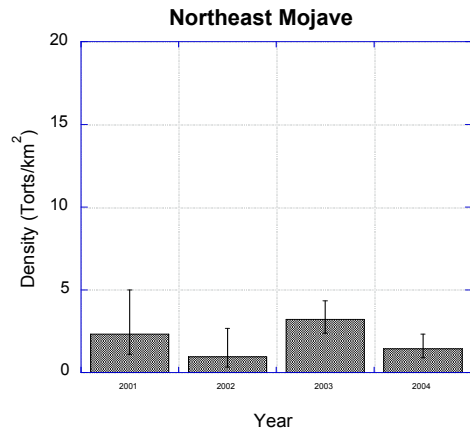
- GIS files (geodatabase, shapefiles, metadata)
 - transects
 - observations
 - threats
 - supporting data (monitoring strata, random start points, available sample area, etc.)
 - G_0
- Scanned copies of any paper datasheets
- Microsoft Access Database
- Microsoft Excel files

QA/QC Status

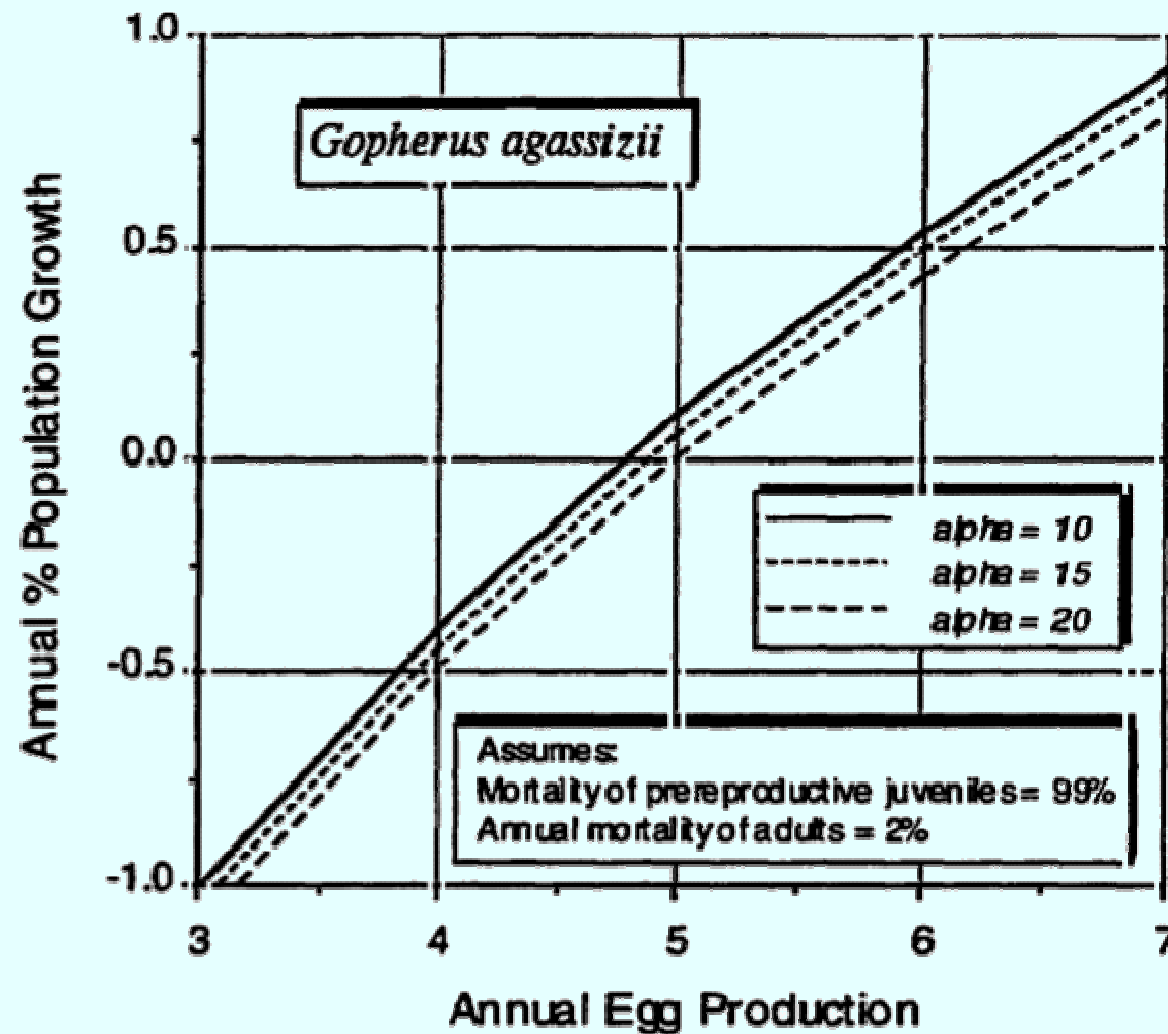


- 2001-2004 Beta release
- 2005 Beta forthcoming
- Beta versions do not include
 - data sheets
 - FGDC metadata
 - G_0

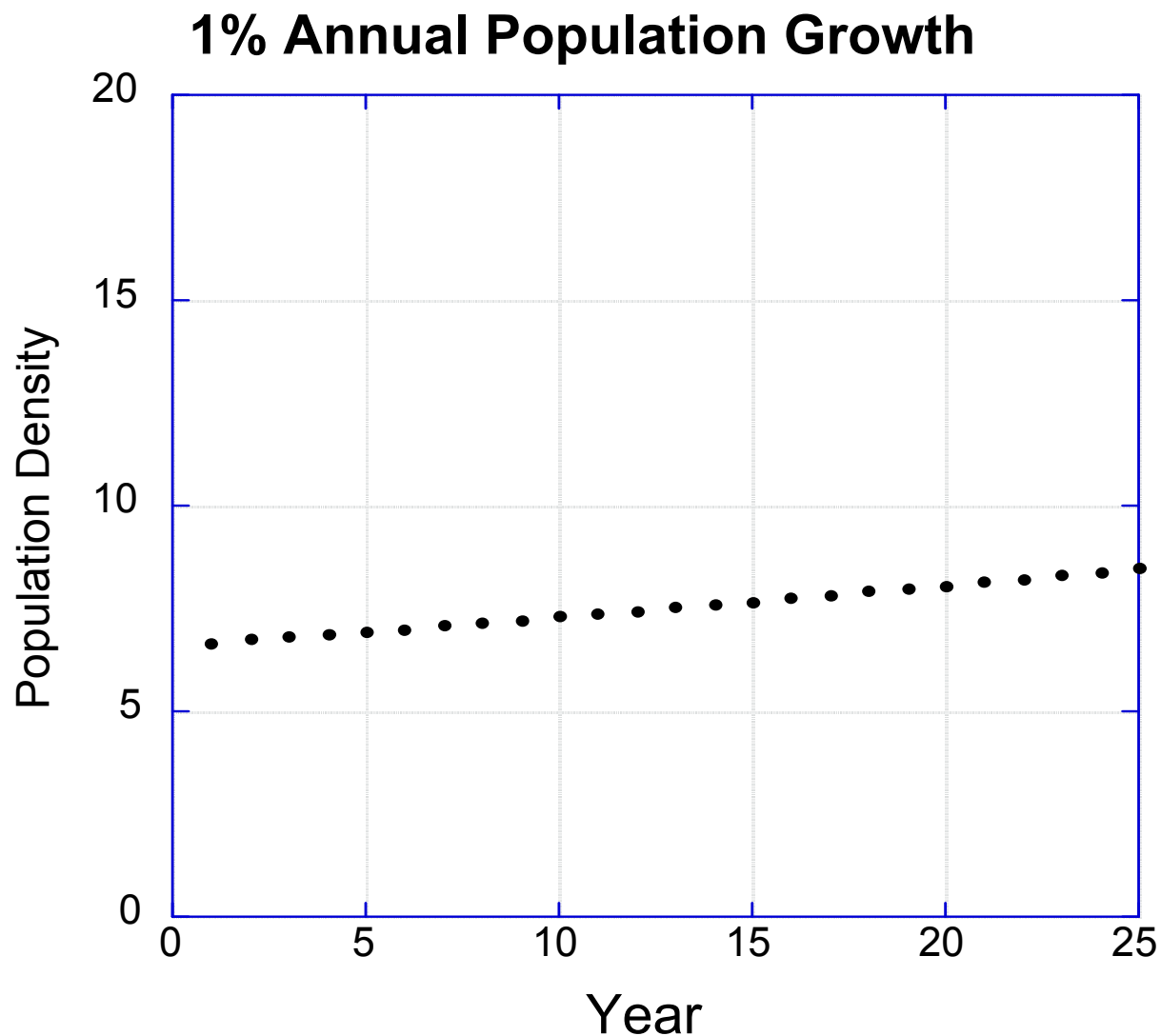
Distance Transect Analyses by Recovery Unit



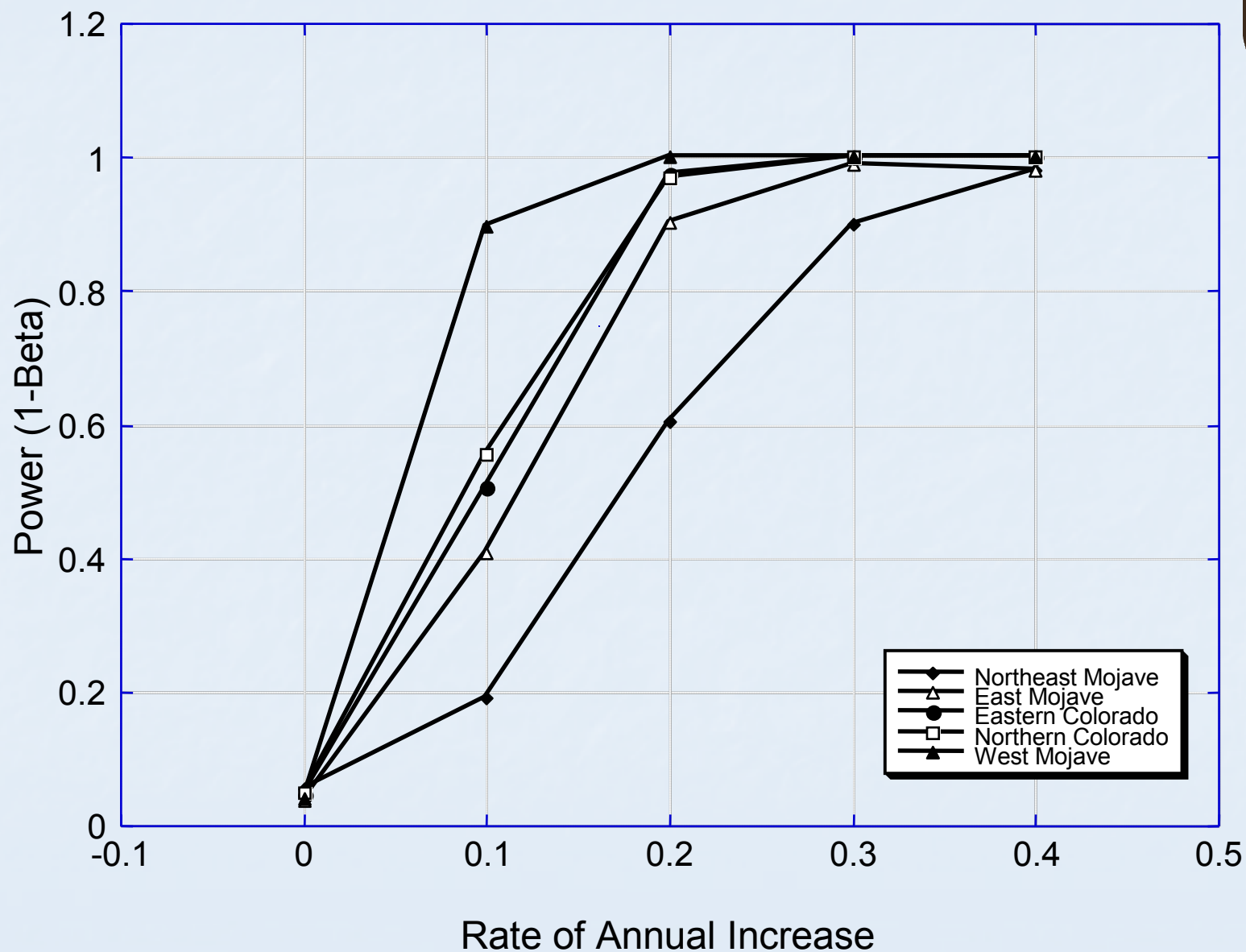
At What Rate Could Populations Increase?



Power to Detect Trends



Power to Detect Trends





Conclusions

- Current level of variation allows for likely detection of 2-3% per year STEADY ANNUAL growth rate
- Tortoise populations aren't expected to increase at more than 1% and process is likely stochastic
- Spatial and other alternative analyses being explored with the same data

Next Steps: 2006



- Program review
- Monitoring Coordinator
 - Linda Allison – June 19
- Managers on DTMC
- Funding

Next Steps: DTMC



- Finalize 2001-05 report, databases
- Clarify program objectives
- Identify necessary analyses
- Improve implementation
- Coordinate administration

Next Steps: Objectives



- Density, abundance, occupancy, etc.
- Effectiveness of management actions (e.g., fencing, removal of grazing, and law enforcement)
- Threats, indicators of threats, and method of action
- Indicators of habitat health
- Evaluate the appropriate spatial scales for the study design

Next Steps: Analysis



- Mine existing data for spatial analysis of occupancy, live and dead tortoises, weather data
- Cooperate with land managers and stakeholders in creating spatial management and use strata
- Solicit participation of additional unconventional analyses
- Continue to develop analytical tools
 - Occupancy estimation and modeling workshop

Next Steps: Implementation



- Improve training and data collection management
- Improve database management, including QA/QC
- Improve data collection protocols including collection of additional data

Next Steps: Administration



- Secure adequate funding for MC, data collection, QA/QC, analysis, and experimental initiatives
- Coordinate administrative requirements for monitoring (e.g., permitting)



P.A.Medica

How Can We Increase Precision?



*Cum length of
transects walked*

*Number of
tortoises seen*

$$D = \frac{n}{(L * w) * Pa * G_0}$$

Detectability of tortoises

*Proportion of tortoises
that are active
(available for sampling)*

Is Sampling or Abundance Affected by Long-term Drought?



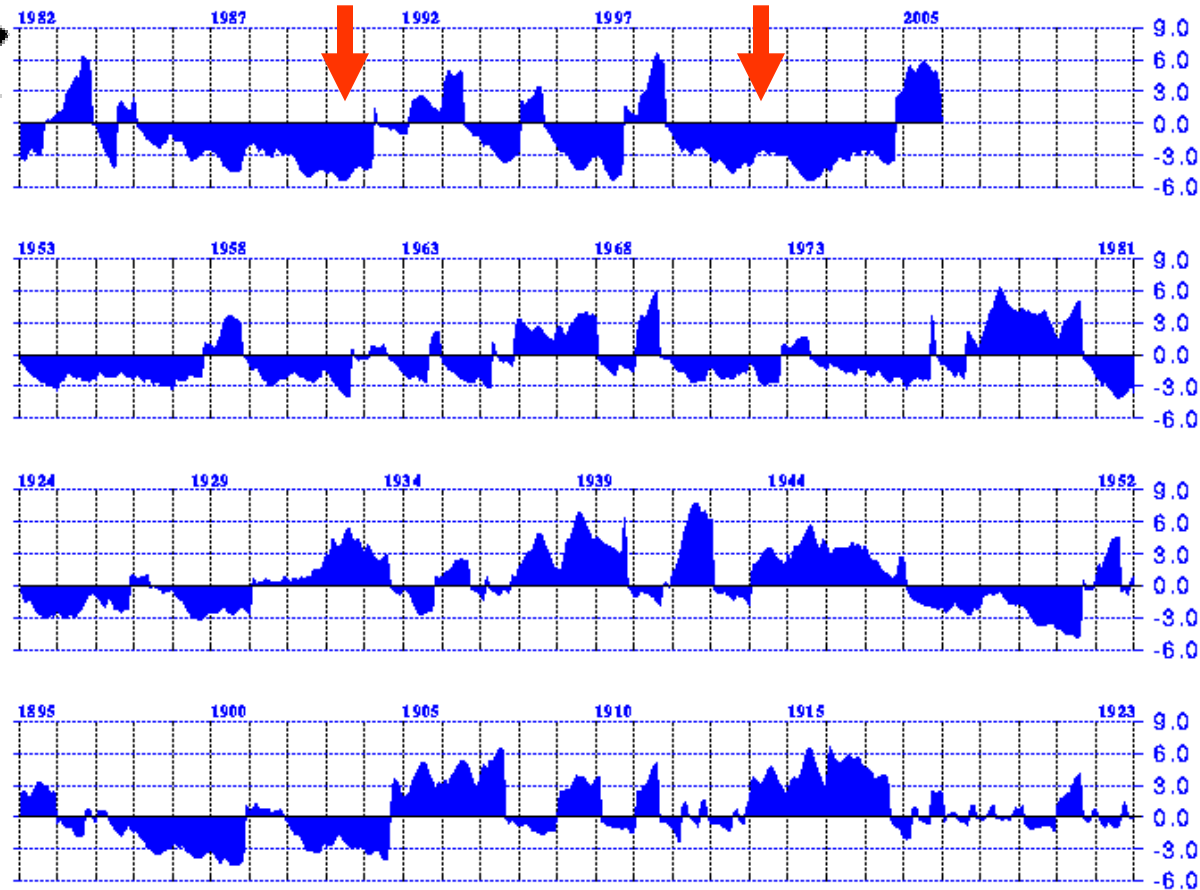
- 2 of the most severe multi-year droughts in the past century have occurred since 1984.
- Potential effects on survival of tortoises
- Drought affects sampling, but effects are partially incorporated into analyses

Drought in the Mojave Desert



Tortoise
Listed

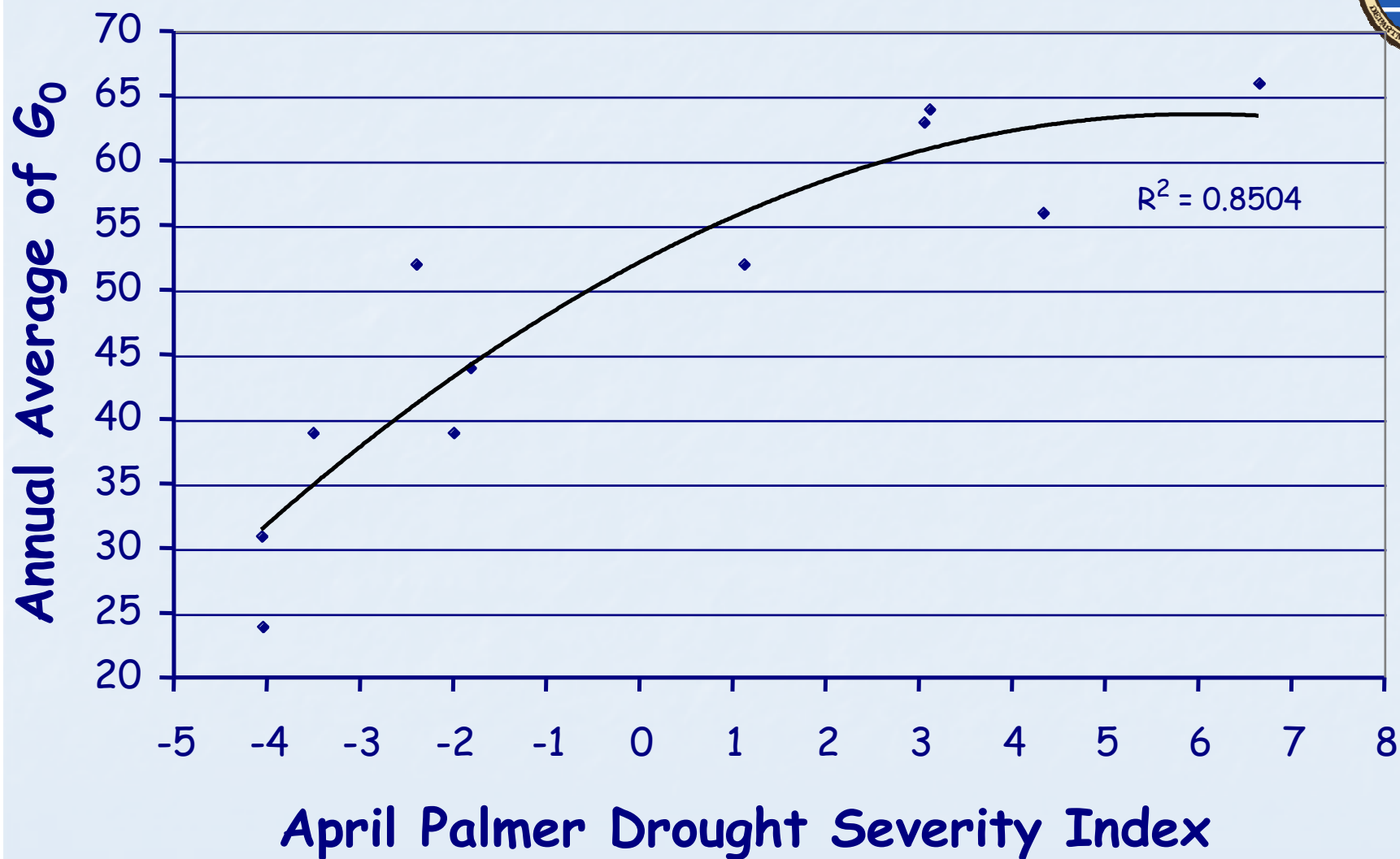
Range-wide
Monitoring
Begins



Palmer Drought Severity Index

California - Division 07: 1895-2005 (Monthly Averages)

G_0 and April Drought Index

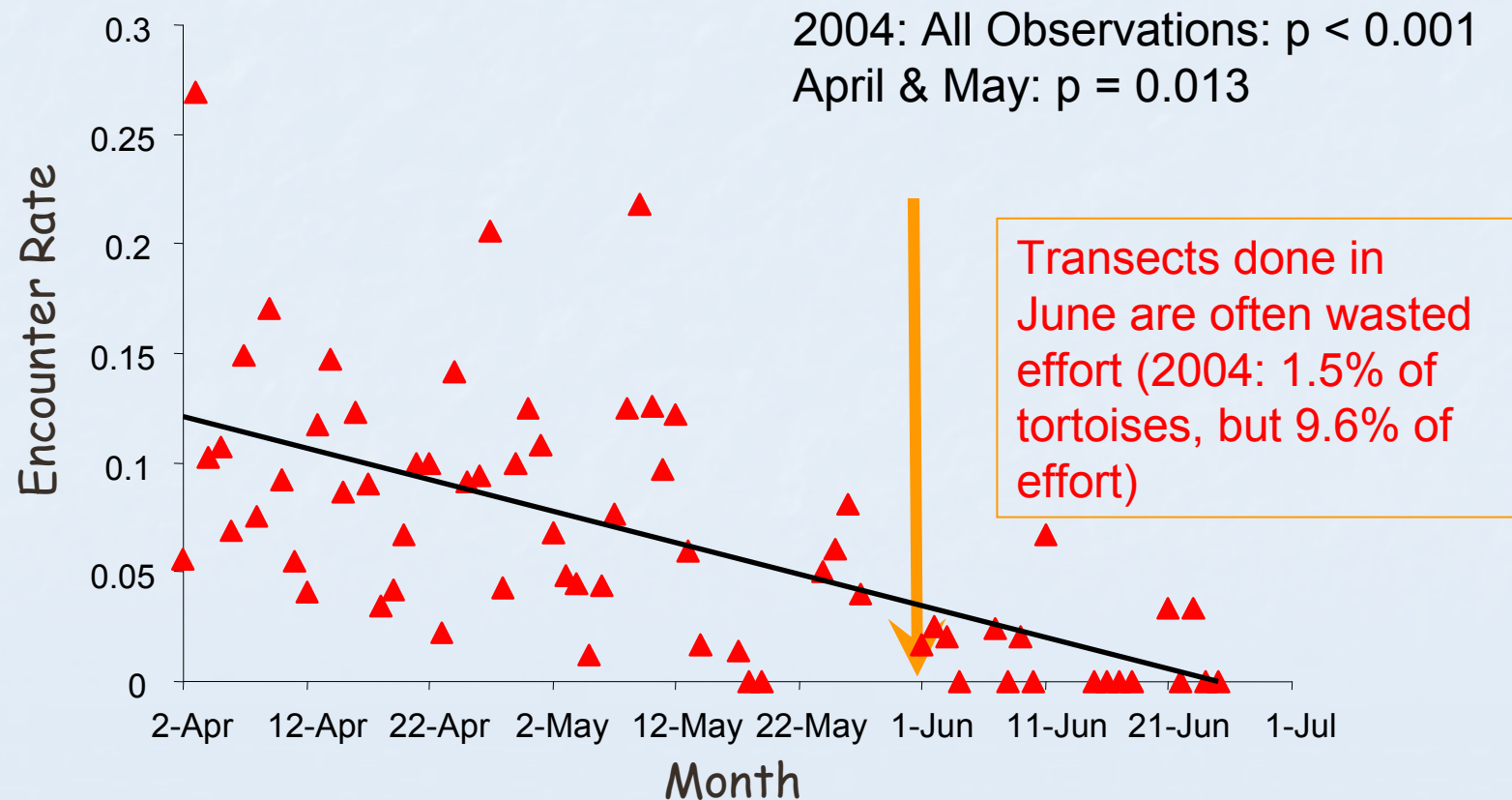


Data from Corn unpublished data

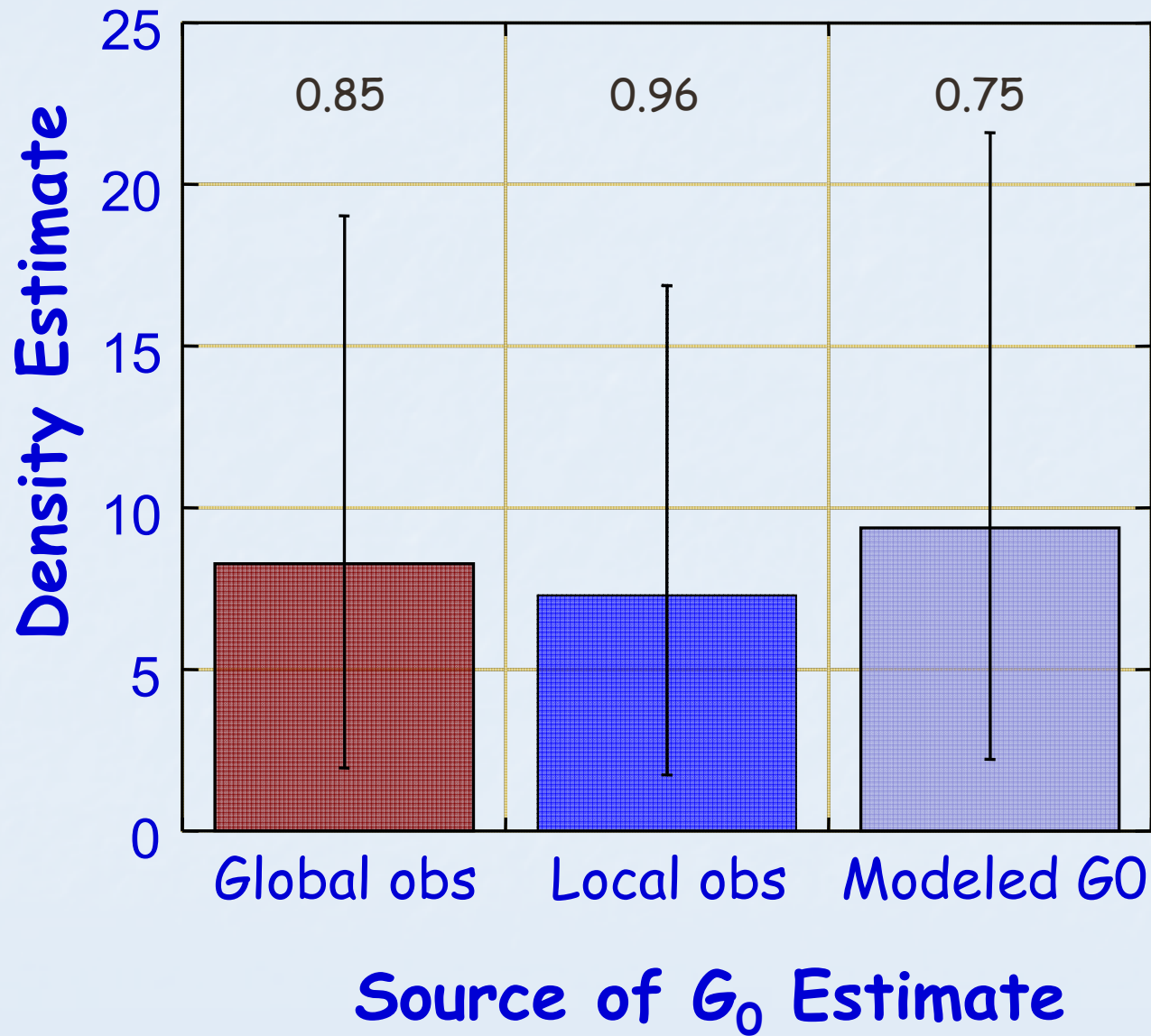
Data Analyses



- Transects in June are generally unproductive
 - Dropped from analysis in 2001 & 2004; kept in 2003 analysis (no June transects on 2002)
 - Date used as covariate in all years

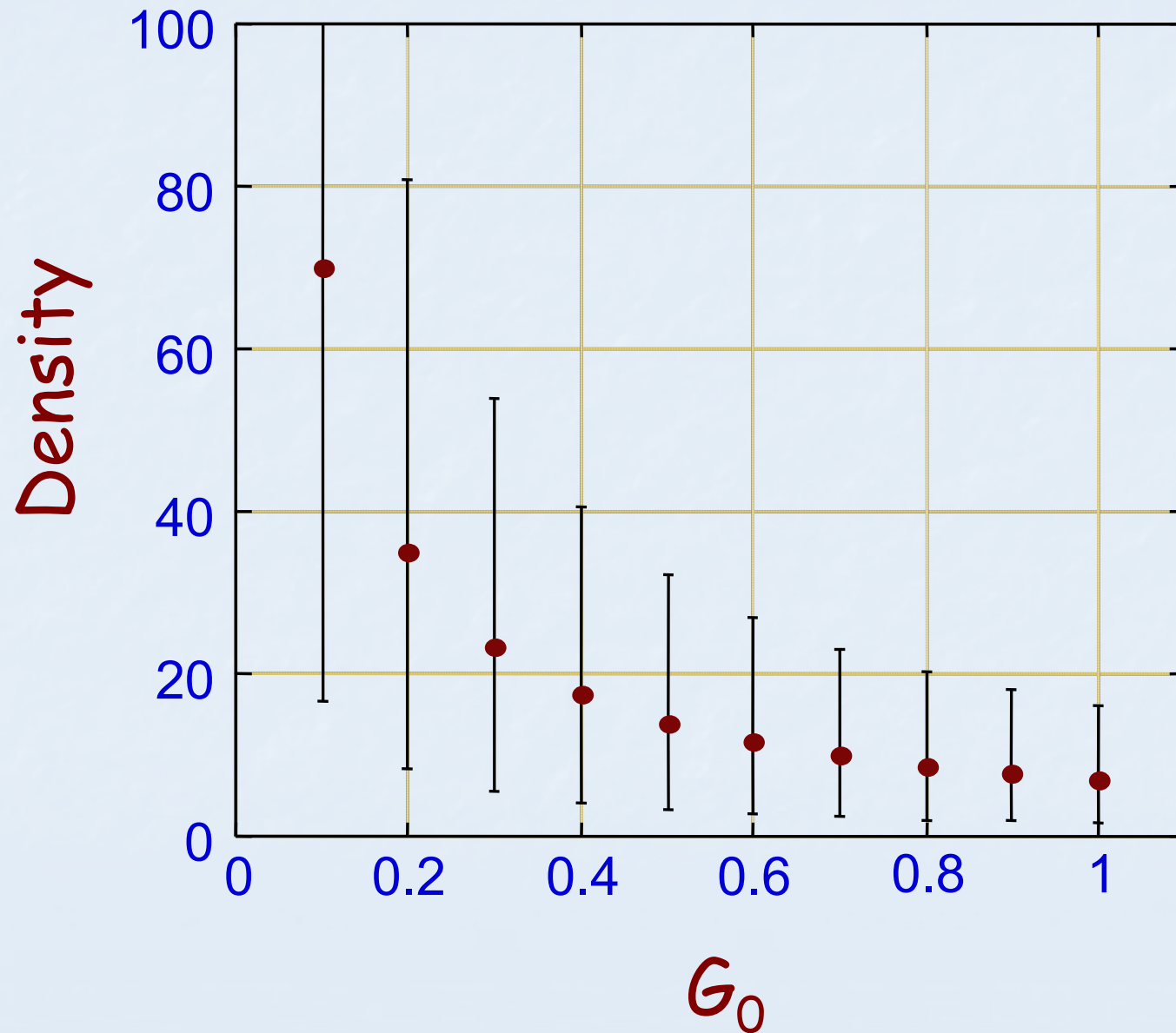


Effect of G_0 on Density

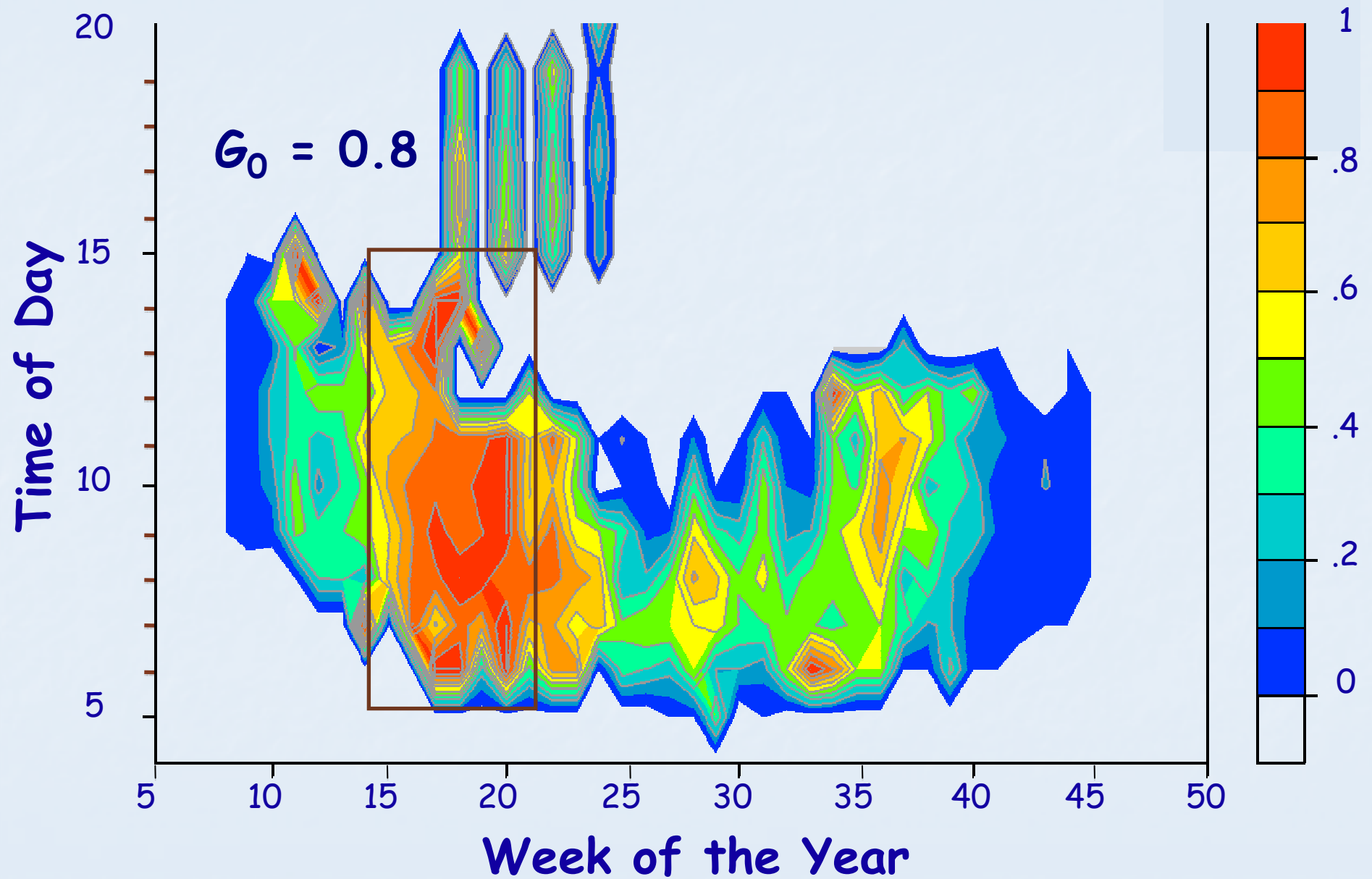


$P_a = 0.3$
175 Transects
(1534.7km X
25 m)
138 Tortoises

Effect of G_0 on Density Estimate



G_0 BSV 1998



G_0 BSV 1999

G_0

